

## 2021 ACES Robotic Equipment Expenditures Methodology

The Annual Capital Expenditures Survey (ACES) is a mandatory annual collection that provides the sole source of economy-wide statistics on business capital expenditures in buildings and other structures, machinery, and equipment by private nonfarm businesses in the United States.

ACES is a sample survey of approximately 50,000 companies with paid employees and 20,000 companies without paid employees. Companies with 500 or more employees are included in the sample each year.

Capital expenditures for both industrial and service robots were collected from companies with employees for the first time on the 2018 survey.

### ACES published estimates

In general, ACES 2021 robotics has the same methodology as the main publication. Please see the main publication for further details.

<https://www.census.gov/programs-surveys/aces/technical-documentation.html>

Firms report for all industries in which they operate and have capital expenditures. Nonresponse is accounted for by nonresponse weight adjustment as a function of payroll. The Disclosure Avoidance methodology is cell suppression, where some estimates are withheld to uphold the privacy of respondents.

### Robotic Equipment Expenditures Estimates

The robotic equipment expenditures were collected at the all-company level, and not at the finer industry level on the earlier 2018 and 2019 surveys.

Beginning with the 2020 survey, robotic equipment expenditures and the presence of robotic equipment were collected by industry segment. This allows the table to be an extension of other tables ACES produces.

Companies were asked to report robotic equipment expenditures for the industries that they had reported capital expenditures for equipment.

Collecting and publishing expenditures at the industry level allows the Census Bureau to provide estimates that reflect the NAICS industries the robotic investments are made in for large companies whose establishments span multiple NAICS codes.

The estimates are published at the national level by 2-digit NAICS sector and select 3-digit and 4-digit NAICS industries in all covered NAICS sectors for employer businesses.

The Census Bureau has reviewed the ACES robotics product for unauthorized disclosure of confidential information and has approved the disclosure avoidance applied (Approval ID: CBDRB-FY23-0162) and for the main ACES data release (Approval ID: CBDRB-FY22-334)